



Department of Energy  
Carlsbad Field Office  
P. O. Box 3090  
Carlsbad, New Mexico 88221

JUN 17 2004



Mr. Steve Zappe, WIPP Project Leader  
Hazardous Waste Permits Program  
New Mexico Environment Department  
2905 E. Rodeo Park Drive, Bldg. 1  
Santa Fe, NM 87505

Subject: Transmittal of Approved RFETS Waste Stream Profile Form Number RF 107.01  
TRU Mixed Solidified Inorganic Waste

Dear Mr. Zappe:

The Department of Energy, Carlsbad Field Office (CBFO) has approved the Rocky Flats Environmental Technology Site (RFETS) Waste Stream Profile Form (WSPF) RF 107.01, TRU Mixed Solidified Inorganic Waste.

Enclosed is a copy of the approved form as required by Section B-4(b)(1) of the WIPP Hazardous Waste Facility Permit, No. NM4890139088-TSDF.

If you have any questions on this matter, please contact me at (505) 234-7357 or (505) 706-0066.

Sincerely,

Kerry W. Watson  
CBFO Assistant Manager  
Office of National TRU Program

Enclosure

cc: w/o enclosure  
J. Kielling, NMED  
C. Walker, TechLaw  
M. Strum, WTS \*ED  
R. Chavez, WRES \*ED  
L. Greene, WRES  
S. Calvert, CTAC \*ED  
WIPP Operating Record  
CBFO M&RC

\*ED denotes Electronic Distribution



## WIPP WASTE STREAM PROFILE FORM

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Waste Stream Profile Number: RF107.01

Generator site name: RFETS

Technical contact: Eric D'Amico

Generator site EPA ID: CO7890010526

Phone number: (303) 966-5362

Date of audit report approval by NMED: March 9, 2000 as amended February 6, 2001; May 24, 2001; June 5, 2001; April 5, 2002; April 8, 2002; August 20, 2002; August 29, 2002; December 20, 2002; April 8, 2003; September 19, 2003; and December 30, 2003

Title, version number, and date of documents used for WAP certification: Rocky Flats Environmental Technology Site TRU Waste Characterization Program Quality Assurance Project Plan, 95-QAPJP-0050, Version 9, February 2004.

Transuranic (TRU) Waste Management Manual, Version 7, 1-MAN-008-WM-001, February 2004. Contact-Handled

Transuranic Waste Acceptance Criteria for the Waste Isolation Pilot Plant, Revision 1.0, March 2004.

Did your facility generate this waste? ☒ Yes ☐ No If no, provide the name and EPA ID of the original generator:

**Waste Stream Information<sup>(1)</sup>**

WIPP ID: RF-MT0800

Summary Category Group: S3000

Waste Matrix Code Group: Solidified Inorganics

Waste Stream Name: Solidified Sludge - Bldg 774/TRM<sup>(2)</sup>

Description from the WTWBIR: This waste stream is a solid cemented sludge.

Defense TRU Waste: ☒ Yes ☐ NoCheck one: ☒ CH ☐ RH Number of SWBs N/A Number of Drums 306 Number of Canisters N/A

Batch Data Report numbers supporting this waste stream characterization: See Table 7.

List applicable EPA Hazardous Waste Codes<sup>(3)</sup>: Numbers D006, D007, D008, D009, D011

Applicable TRUCON Content Codes: RF 132A/232A, RF 132D/232D, RF 132DF/232DF, RF 132J/232J, RF 132K/232K, RF 132P/232P, RF 132Q/232Q, RF 132QA/232QA

**Acceptable Knowledge Information<sup>(1)</sup>****Required Program Information**

- Map of site: Reference List, No. 3
- Facility mission description: Reference List, No. 3
- Description of operations that generate waste: Reference List, Nos. 1, 2, 3, 6
- Waste identification/categorization schemes: Reference List, Nos. 13, 14
- Types and quantities of waste generated: Reference List, Nos. 1, 2, 3, 6
- Correlation of waste streams generated from the same building and process, as appropriate: Reference List, Nos. 1, 2, 6
- Waste certification procedures: Reference List, No. 5

**Required Waste Stream Information**

- Area(s) and building(s) from which the waste stream was generated: Reference List, Nos. 1, 2, 6
- Waste stream volume and time period of generation: Reference List, Nos. 4, 6
- Waste generating process description for each building: Reference List, Nos. 1, 2, 6
- Process flow diagrams: Reference List, Nos. 1, 2
- Material inputs or other information identifying chemical/radionuclide content and physical waste form: Reference List, Nos. 1, 2, 3, 6
- Which Defense Activity generated the waste: (Check one) Reference List, No. 3
  - ☒ Weapons activities including defense inertial confinement fusion
  - ☐ Naval Reactors development
  - ☐ Verification and control technology
  - ☐ Defense research and development
  - ☐ Defense nuclear waste and material by products management
  - ☐ Defense nuclear materials production
  - ☐ Defense nuclear waste and materials security and safeguards and security investigations

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Supplemental Documentation:

- Process design documents: Note 4
- Standard operating procedures: Note 4
- Safety Analysis Reports: Note 4
- Waste packaging logs: Note 4
- Test plans/research project reports: Note 4
- Site data bases: Note 4
- Information from site personnel: Note 4
- Standard industry documents: Note 4
- Previous analytical data: Note 4
- Material safety data sheets: Note 4
- Sampling and analysis data from comparable/surrogate Waste: Note 4
- Laboratory notebooks: Note 4

Sampling and Analysis Information<sup>(1)</sup>*(For the following, when applicable, enter procedure title(s), number(s) and date(s))*

- ☒ Radiography: Reference List, Nos. 21, 22, 23
- ☒ Visual Examination: Reference List, Nos. 17, 24, 25, 26
- ☒ Headspace Gas Analysis
  - VOCs: Reference List, No. 7, 19, 20
  - Flammable: Reference List, No. 7, 19, 20
  - Other gases (specify): N/A
- ☒ Homogeneous Solids/Soils/Gravel Sample Analysis
  - Total metals: Reference List, Nos. 11, 12
  - PCBs: N/A
  - VOCs: Reference List, No. 8
  - Nonhalogenated VOCs: Reference List, No. 10
  - Semi-VOCs: Reference List, No. 9
  - Other (specify): N/A

Waste Stream Profile Form certification:

I hereby certify that I have reviewed the information in this Waste Stream Profile Form, and it is complete and accurate to the best of my knowledge. I understand that this information will be made available to regulatory agencies and that there are significant penalties for submitting false information, including the possibility of fines and imprisonment for knowing violations.

  
Signature of Site Project Manager

G. A. O'Leary, Manager TRU Programs  
Printed Name and Title

6/16/04  
Date

  
Signature of Site QA Officer

C. L. Ferrera, TWCP Site QAO  
Printed Name and Title

6/16/04  
Date

- NOTE**
- (1) Use back of sheet or continuation sheets, if required.
  - (2) The Waste Stream Name has been changed to TRM Solidified Inorganic Waste (D006, D007, D008, D009, D011).
  - (3) EPA Hazardous Waste Codes were determined using acceptable knowledge and confirmed using solids and headspace gas sampling and analysis (see attached Characterization Information Summary documenting this determination).
  - (4) See the References section in the Acceptable Knowledge Summary (attached) for additional backup documentation associated with this waste stream.

## REFERENCE LIST

1. Backlog Waste Reassessment Baseline Book, Waste Form 55, Building 774 Aqueous Sludge, May 2004.
2. Waste Stream and Residue Identification and Characterization (WSRIC), Version 7, April 2004, and archived versions.
3. RFETS TRU Waste Acceptable Knowledge Supplemental Information, RF/RMRS-97-018, Revision 13, May 2004.
4. Waste and Environmental Management System (WEMS) database.
5. Transuranic (TRU) Waste Certification, PRO-X05-WC-4018, Version 7, March 2004.
6. Acceptable Knowledge TRU/TRM Waste Stream Summaries, RMRS-WIPP-98-100, Section 7.24, Revision 0, May 2004.
7. GC/MS Determination of Volatile Organics Waste Characterization, L-4111-X, January 2002.
8. Volatile Organic Compounds by Gas Chromatography Mass Spectrometry, ACMM-9260, Revision 9, July 2003.
9. Semivolatile Organic Compounds by Gas Chromatography/Mass Spectrometry, ACMM-9270, Revision 5, April 2003.
10. Determination of Nonhalogenated Volatile Organics by Gas Chromatography, ACMM-9441, Revision 8, April 2003.
11. Determination of Mercury by CVAA for TRU Waste Characterization, ACMM-2810, Revision 2, April 2003.
12. Determination of Metals by ICP-AES for TRU Waste Characterization, ACMM-2901, Revision 2, April 2003.
13. Waste Characterization, Generation, and Packaging, 1-PRO-079-WGI-001, Revision 4, May 2002.
14. Waste Characterization Program Manual, 1-MAN-036-EWQA-Section 1.6.1, Revision 3, May 2002.
15. Interoffice Memorandum from Douglas K. Sullivan to Eric L. D'Amico, Headspace Gas Analysis Data Evaluation Report For Waste Stream Profile RF107.01 Lot 2, DKS-009-04, May 2004.
16. Interoffice Memorandum from Thomas R. Gatliffe to Eric L. D'Amico, Statistical Solid Analysis Data Evaluation Report For Waste Stream Profile RF107.01 (TRM Solidified Inorganic Waste [D006, D007, D011]) Lot 2, TRG-079-04, March 2004.
17. TRU/TRM Waste Visual Verification ( $V^2$ ) and Data Review, PRO-1031-WIPP-1112, Version 3, March 2004.
18. Interoffice Memorandum from V. S. Sendelweck to E. L. D'Amico, Tentatively Identified Compounds in TRM Solidified Inorganic Waste (D006, D007, D011) Lot 2, VSS-006-2004, March 2004.
19. Headspace Gas Sampling And Analysis Using An Automated Manifold, L-4231-F, March 2002
20. Headspace Gas Sampling and Analysis Using An On-Line Integrated System, PRO-1676-HGAS-S&A, Version 2, January 2004.
21. Real-Time Radiography Testing of Transuranic and Low-Level Waste, 4-W30-NDT-00664, Version 10, March 2004.
22. Real-Time Radiography Testing of Transuranic and Low-Level Waste in Building 569, 4-119-NDT-00569, Revision 5, January 2002.
23. Mobile Real-Time Radiography Testing of Transuranic and Low-Level Waste, PRO-1520-Mobile-RTR, Version 3, March 2004.
24. Glovebox and C-Cell Waste Operations, PRO-1358-440-VERP, Version 6, March 2004.
25. RTR Visual Examination Confirmation, Building 371, PRO-1608-VECRTR-371, Revision 0, October 2002.
26. Visual Examination for Confirmation of RTR, 4-H80-776-ASRF-007, Revision 5, June 2001.
27. TWCP Core-Drilling Operation, HFEF-OI-6910, Revision 2c, April 2003.
28. TWCP Solid Sample Preparation, HFEF-OI-6921, Revision 3c, July 2003.

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**Form A**  
**Reconciliation with Data Quality Objectives**

I certify by signature (below) that sufficient data have been collected to determine the following Program-required waste parameters:

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Item	Check Box <sup>a</sup>	Reconciliation Parameter
1	✓	Waste Matrix Code as reported in WEMS.
2	✓	Waste Material Parameter Weights for individual containers as reported in WEMS.
3	✓	The waste matrix code identified is consistent with the type of sampling and analysis used to characterize the waste.
4	✓	Container mass and activities of each radionuclide of concern as reported in WEMS.
5	✓	Each waste container of waste contains TRU radioactive waste.
6	✓	Mean concentrations, UCL <sub>90</sub> for the mean concentrations, standard deviations, and the number of samples collected for each VOC in the headspace gas of waste containers in the waste stream/waste stream lot.
7	✓	Mean concentrations, UCL <sub>90</sub> for the mean concentrations, standard deviations, and number of samples collected for VOCs in the waste stream/waste stream lot. Summary Categories S3000 and S4000.
8	✓	Mean concentrations, UCL <sub>90</sub> for the mean concentrations, standard deviations, number of samples collected for SVOCs in the waste stream/waste stream lot. Summary Categories S3000 and S4000.
9	✓	Mean concentrations, UCL <sub>90</sub> for the mean concentrations, standard deviations, and number of samples collected for metals in the waste stream/waste stream lot. Summary Categories S3000 and S4000.
10	✓	Sufficient number of samples was taken to meet statistical sampling requirements.
11	✓	Only validated data were used in the above calculations, as documented through the site data review and validation forms and process.
12	✓	Waste containers were selected randomly for sampling, as documented in site procedures.
13	✓	The potential flammability of TRU waste headspace gases.
14	✓	Sufficient number of waste containers was visually examined to determine with a reasonable level of certainty that the UCL <sub>90</sub> for the misclassification rate is less than 14 percent.
15	✓	Whether the waste stream exhibits a toxicity characteristic (TC) under 40 CFR Part 261, Subpart C.
16	✓	All TICs were appropriately identified and reported in accordance with the requirements of the WIPP WAP prior to submittal of a waste stream profile form for a waste stream or waste stream lot.
17	✓	The overall completeness, comparability, and representativeness QAOs were met for each of the analytical and testing procedures as specified in the WIPP WAP Sections B3-2 through B3-9 prior to submittal of a waste stream profile form for a waste stream or waste stream lot.
18	✓	The RTLs (i.e., PRQLs) for all analyses were met prior to submittal of a waste stream profile form for a waste stream or waste stream lot.
19	✓	Appropriate packaging configuration and DAC were met and documented in the headspace gas sampling documentation and the drum age was met prior to sampling.
20	✓	Whether the waste stream can be classified as hazardous or non-hazardous at the 90-percent confidence limit.

<sup>a</sup> Check (✓) indicates that data or acceptable knowledge are sufficient to determine the waste parameters and that the waste parameters have been reported in the listed document or database. N/A indicates parameter does not apply to waste stream. NO indicates data are insufficient.

  
 Signature of Site Project Manager

 G. A. O'Leary  
 Printed Name

 6/16/04  
 Date

## Data Summary Report—Table 1: Solid Sampling Summary

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**Determination of Number of Retrievably Stored Waste Containers to Sample (S3000,S4000)**

Preliminary Estimates of Mean, Variance, and Coefficient of Variation:

Attach a table(s) that correlates container identification numbers to data packages if different from containers used for characterization.

Description of Source Data: Preliminary samples were collected and analyzed in compliance with all requirements (specified in the WIPP Waste Analysis Plan Section B2-2a) for being counted as part of the total number of calculated required samples. Sufficient preliminary samples were collected to demonstrate sampling sufficiency – i.e., collection of additional samples other than the preliminary samples was not required. See Reference List, No 16.

Samples Randomly Selected from Waste Stream (yes/no)? Yes.

Treatment of less-than-detectable measurements: This pertains only to data for analytes in which at least one detectable measurement was obtained. Data were evaluated using one half the method detection limit (MDL) for less-than-detectable observations. See Reference List, No. 16.

Analytes that are listed spent solvents and therefore not included in the calculation to determine the number of containers to sample: None.

Largest Calculated Sample Size selection and associated analyte: Pertains only to toxicity characteristic or listed waste analytes and only to those analytes where the associated EPA hazardous waste number is not assigned (i.e., it only applies to those cases where a site intends to establish that the constituent is below the regulatory threshold and the associated EPA hazardous waste number does not apply). Largest value is 0.271 for methanol.

Minimum number of containers to sample: 5 (based on WIPP Waste Analysis Plan Section B2-2a requirement that preliminary estimates be based on samples from a minimum of 5 waste containers).

Attach preliminary estimates: See Reference List, No. 16. Preliminary estimates are identical to final results because sufficient preliminary samples were collected and analyzed in compliance with all requirements for being used as required samples.

## Data Summary Report—Table 1: Solid Sampling Summary (continued)

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**Retrievably Stored Waste Sampling Results**

Analytes that are listed spent solvents and therefore not included in the UCL<sub>90</sub> estimate calculation to determine the toxicity characteristic: None.

Largest Calculated Sample Size and associated analyte: Pertains only to toxicity characteristic or listed waste analytes and only to those analytes where the associated EPA hazardous waste number is not assigned (i.e., it only applies to those cases where a site intends to establish that the constituent is below the regulatory threshold and the associated EPA hazardous waste number does not apply). Largest value is 0.271 for methanol.

Comparison of largest calculated sample size with largest calculated sample size selected from preliminary estimate: 0.271 vs. 0.271 (for methanol)

Treatment of less-than-detectable measurements: This pertains only to data for analytes in which at least one detectable measurement was obtained. Data were evaluated using one half the method detection limit (MDL) for less-than-detectable observations. See Reference List, No. 16.

Transformations applied to data and justification: Logarithmic or Square Root transformations were applied to the data as necessary to achieve (or better achieve) a normal probability distribution of the data for UCL<sub>90</sub> comparison to RTL values.

Drums overpacked for shipment/WWIS tracking (Yes/No)? No.

If yes, overpack container identification number: \_\_\_\_\_

Sampled drums included in waste stream lot reported here (Yes/No)? Yes.

If no, WSPF # including sampled drums: \_\_\_\_\_

**Newly Generated Waste Sampling Results**

Batch or continuous process? N/A<sup>a</sup>

Samples randomly selected from Waste Stream? (yes/no) N/A<sup>a</sup>

Sample locations (part of process): N/A<sup>a</sup>

Treatment of less-than-detectable measurements: N/A<sup>a</sup>

Transformations applied to data and justification: N/A<sup>a</sup>

**NOTES:**

- <sup>a</sup> This waste stream is comprised of retrievably stored waste that was sampled by coring; therefore, Newly Generated Waste Sampling is not applicable.

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## Data Summary Report—Table 2: Headspace Gas Summary Data

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Sampling and Analysis Method (check one):

☐ 100% Sampling

☒ Reduced Sampling

2A

ANALYTE <sup>a</sup>	# Samples <sup>b</sup>	Transform Applied <sup>c</sup>	Normality Test (Pass/Fail) <sup>d</sup>	Min. Sample Size <sup>d</sup>	Mean <sup>d</sup>	UCL <sup>d</sup>	Transformed RTL <sup>e</sup>	Un-Transformed RTL <sup>e</sup> (ppmV)	EPA Code <sup>f</sup>
1,1-Dichloroethane	0				1.41			10	
1,2-Dichloroethane	0				1.68			10	
1,1-Dichloroethylene	0				1.30			10	
cis-1,2-Dichloroethylene	0				1.30			10	
trans-1,2-Dichloroethylene	0				1.35			10	
1,1,2,2-Tetrachloroethane	0				1.28			10	
1,1,1-Trichloroethane	0				1.50			10	
1,1,2-Trichloro-1,2,2-Trifluoroethane	0				1.38			10	
1,2,4-Trimethylbenzene	0				1.25			NA	
1,3,5-Trimethylbenzene	0				1.23			NA	
Acetone	0				15.05			100	
Benzene	0				1.24			10	
Bromoform	0				1.19			10	
Butanol	0				14.75			100	
Carbon disulfide	0				1.35			10	
Carbon tetrachloride	0				1.55			10	
Chlorobenzene	0				1.18			10	
Chloroform	0				1.29			10	
Cyclohexane	0				1.51			NA	
Ethyl benzene	0				1.16			10	
Ethyl ether	0				1.24			10	
Methanol	0				14.10			100	
Methyl ethyl ketone	0				14.90			100	
Methyl isobutyl ketone	0				13.70			100	
Methylene chloride	0				1.19			10	
o-Xylene	0				1.06			10	
m,p-Xylene	0				2.48			10	
Tetrachloroethylene	0				1.22			10	
Toluene	1	Log	Fail <sup>d</sup>	0.005	0.181	0.290	4.277	72.02 <sup>e</sup>	
Trichloroethylene	0				1.33			10	

### NOTES:

<sup>a</sup> A total of 10 samples were collected and analyzed. Analysis was performed for all analytes identified. Samples were not composited.

<sup>b</sup> Identifies the number of samples in which the associated analyte was detected.

<sup>c</sup> Identifies the type of data transformation used, if applicable, to achieve (or better achieve) a normal probability distribution of the data.



**Data Summary Report—Table 2: Headspace Gas Summary Data (continued)****NOTES (continued):**

- <sup>d</sup> Statistics calculated based on using  $\frac{1}{2}$  the MDL for less-than-detectable observations with data transformation as identified (Reference 15). When transformation was applied, the Mean and UCL<sub>90</sub> values presented are the transformed values (Reference 15). With no detectable concentrations, listed mean reflects average of one-half of reported MDL values for analyte and calculation of standard deviation and UCL<sub>90</sub> values is not meaningful. With fewer than five detectable concentrations, calculated values for UCL<sub>90</sub> are subject to potentially large relative error.
- <sup>e</sup> RTLs for headspace gas analysis results correspond to the analyte PRQL for analytes that are WIPP WAP target analytes. "NA" means the analyte is not a WIPP WAP target analyte, but instead a flammable VOC that is analyzed for compliance with the TRUPACT-II Authorized Methods for Payload Control (TRAMPAC).
- <sup>f</sup> No entry indicates that the respective UCL<sub>90</sub> value did not exceed the associated RTL.
- <sup>g</sup> Data set (with or without transformation) did not pass the test for normality. The data set that most approximated a normal distribution was used for computation of statistics.
- <sup>h</sup> Limit used for evaluation of EPA Hazardous Waste Code for toluene (Reference No. 3).

## Data Summary Report—Table 2: Headspace Gas Summary Data (continued)

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2B

TENTATIVELY IDENTIFIED COMPOUND (TIC)	Maximum Observed Estimated Concentration (ppmV)	# Samples Containing TIC
No TICs identified in the headspace gas samples for the waste stream lot.		

Did the data verify the acceptable knowledge? ☒ Yes ☐ No

Data as reported in Data Summary Report – Table 2 confirms acceptable knowledge in that no EPA codes, other than those already assigned by acceptable knowledge, are applicable.

If not, describe the basis for assigning the EPA Hazardous Waste Codes:

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## Data Summary Report—Table 3: Metals Summary Data

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Sampling and Analysis Method/Units (check one):

☒ Totals (units are in mg/kg)

☐ TCLP (units are in mg/l)

ANALYTE <sup>a</sup>	# Samples <sup>b</sup>	Transform Applied <sup>c</sup>	Normality Test (Pass/Fail) <sup>d</sup>	Min. Sample Size <sup>d</sup>	Mean <sup>d</sup>	UCL <sub>90</sub> <sup>d</sup>	Transformed RTL <sup>e</sup>	Un-Transformed RTL <sup>e</sup> (mg/kg)	EPA Code <sup>f</sup>
Antimony	6	Log	Pass	0.479	1.573	2.429	4.605	100	
Arsenic	6	None	Pass	0.000	3.067	3.6	N/A	100	
Barium	6	Log	Pass	0.074	3.278	3.8	7.6	2000	
Beryllium <sup>g</sup>	6	Log	Pass	0.581	7.629	8.6	4.605	100	None
Cadmium	6	Log	Pass	1.842	1.486	2.323	2.996	20	
Chromium	6	Sq. Rt.	Pass	20.626	11.932	15.514	10	100	D007
Lead	6	Sq. Rt.	Pass	10.372	7.558	10.769	10	100	D008
Mercury	6	Log	Pass	1.967	-0.881	0.417	1.386	4	
Nickel	6	None	Pass	16.798	82.167	112.006	N/A	100	None
Selenium	1	Log	Fail <sup>h</sup>	0.012	-1.746	-1.532	2.996	20	
Silver	6	Log	Pass	168.364	4.738	5.441	4.605	100	D011
Thallium	3	Sq. Rt.	Pass	0.005	0.899	1.16	10	100	
Vanadium	6	Log	Pass	0.220	2.755	3.109	4.605	100	
Zinc	6	Log	Pass	73.284	4.404	5.106	4.605	100	None

Did the data verify the acceptable knowledge? ☐ Yes ☒ No

If not, describe the basis for assigning the EPA Hazardous Waste Codes.

EPA codes D006, D007 and D011 were initially assigned to this waste stream based on acceptable knowledge. EPA codes D007 and D011 were confirmed by homogeneous solids sampling and analysis. EPA code D006 is being conservatively retained as an assigned hazardous waste code for the waste stream. EPA code D008 was added to the waste stream because the UCL<sub>90</sub> value for lead exceeded the RTL. Although the UCL<sub>90</sub> for mercury was below the RTL, the EPA code D009 (mercury) was conservatively added to the waste stream based on results from homogeneous solids sampling and analysis (see Reference No. 16).

### NOTES:

- <sup>a</sup> A total of 6 samples were collected and analyzed. Analysis was performed for all analytes identified.
- <sup>b</sup> Identifies the number of samples in which the associated analyte was detected.
- <sup>c</sup> Identifies the type of data transformation used, if applicable, to achieve (or better achieve) a normal probability distribution of the data.
- <sup>d</sup> Statistics calculated based on using ½ the MDL values for all less-than-detectable observations with data transformation as identified (Reference 16). When transformation was applied, the Mean and UCL<sub>90</sub> values presented are the transformed values (Reference 16). No entry indicates no detectable measurements available for statistics.
- <sup>e</sup> RTLs correspond to the analyte PRQL for analytes that are not characteristic hazardous waste constituents.
- <sup>f</sup> No entry indicates that the applicable UCL<sub>90</sub> value did not exceed the associated RTL.

## Data Summary Report—Table 3: Metals Summary Data (continued)

## NOTES (continued):

- <sup>g</sup> The EPA hazardous waste number P015, beryllium powder, is not applicable to this waste stream. The applicable regulations controlling the identification of U and P listed hazardous wastes are given in 40 CFR 261.33, Discarded Commercial Chemical Products, Off-Specification Species, Container Residues, and Spill Residues Thereof. Within this regulation, it states that "The phrase 'commercial chemical product or manufacturing chemical intermediate having the generic name listed in...' refers to a chemical which is manufactured or formulated for commercial or manufacturing use which consists of the commercially pure grade of the chemical, any technical grades of the chemical that are produced or marketed, and all formulations in which the chemical is the sole active ingredient. It does not refer to a material, such as a manufacturing process waste, that contains any of the substances listed in paragraph (e) or (f). Where a manufacturing process waste is deemed to be a hazardous waste because it contains a substance listed in paragraph (e) or (f), such waste will be listed in either Sec. 261.31 or Sec. 261.32 or will be identified as a hazardous waste by the characteristics set forth in subpart C of this part." Beryllium parts were used in the manufacture/assembly of weapons components, and residual beryllium contamination of plutonium parts may have occurred. As a result beryllium is present in the solidified inorganic waste. The beryllium is present as a contaminant of the process and not as unused commercial chemical product, and therefore is not a P015-listed waste.
- <sup>h</sup> Data transformation did not pass the test for normality. The data transformation that most approximated a normal distribution was used for computation of statistics.

Data Summary Report—Table 4: Total VOC Summary Data

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4A

ANALYTE <sup>a</sup>	# Samples <sup>b</sup>	Transform Applied <sup>c</sup>	Normality Test (Pass/Fail) <sup>d</sup>	Min. Sample Size <sup>d</sup>	Mean <sup>d</sup>	UCL <sub>90</sub> <sup>d</sup>	Transformed RTL <sup>e</sup>	Un-Transformed RTL <sup>e</sup> (mg/kg)	EPA Code <sup>f</sup>
1,1-Dichloroethylene	0				0.093			14	
trans-1,2-Dichloroethylene	0				0.188			10	
1,2-Dichloroethane	0				0.188			10	
1,1,1-Trichloroethane	0				0.188			10	
1,1,2-Trichloro-1,2,2-Trifluoroethane	0				0.188			10	
1,1,2-Trichloroethane	0				0.093			10	
1,1,2,2-Tetrachloroethane	0				0.188			10	
Acetone	0				1.058			100	
Benzene	0				0.093			10	
Bromoform	0				0.188			10	
Butanol	1	Log	Fail <sup>g</sup>	0.115	0.447	1.024	4.605	100	
Carbon disulfide	0				0.093			10	
Carbon tetrachloride	0				0.188			10	
Chloroform	0				0.188			120	
Chlorobenzene	0				0.093			10	
Ethyl benzene	0				0.093			10	
Ethyl ether	0				1.583			100	
Isobutanol	0				1.075			100	
Methanol	3	Log	Fail <sup>g</sup>	0.271	1.477	2.142	4.605	100	
o-Xylene	0				0.093			10	
m,p-Xylene	0				0.188			10	
Methyl ethyl ketone	1	Log	Pass	0.010	0.306	0.481	4.605	100	
Methylene chloride	0				0.093			10	
Tetrachloroethylene	0				0.093			10	
Toluene	0				0.093			10	
Trichloroethylene	0				0.188			10	
Trichlorofluoromethane	0				0.093			10	
Vinyl chloride	0				0.093			4	

## NOTES:

- <sup>a</sup> A total of 6 samples were collected and analyzed. Analysis was performed for all analytes identified.
- <sup>b</sup> Identifies the number of samples in which the associated analyte was detected.
- <sup>c</sup> Identifies the type of data transformation used, if applicable, to achieve (or better achieve) a normal probability distribution of the data.
- <sup>d</sup> Statistics calculated based on using ½ the MDL values for all less-than-detectable observations with data transformation as identified (Reference 16). No entry indicates no detectable measurements available for statistics.
- <sup>e</sup> RTLs correspond to the analyte PRQL for analytes that are F-listed hazardous waste constituents or to the applicable total RTL value as calculated from the TC RTL. RTLs correspond to the analyte PRQL for analytes that are not F-listed or characteristic hazardous waste constituent.

## Data Summary Report—Table 4: Total VOC Summary Data (continued)

## NOTES (continued):

- <sup>f</sup> No entry indicates that the applicable  $UCL_{90}$  value did not exceed the associated RTL.
- <sup>g</sup> Data transformation did not pass the test for normality. The data transformation that most approximated a normal distribution was used for computation of statistics.

## Data Summary Report—Table 4: Total VOC Summary Data (continued)

WSPF # RF107.01

4B

TENTATIVELY IDENTIFIED COMPOUND (TIC) CHEMICAL ABSTRACTS SERVICE (CAS) Number	Maximum Observed Estimated Concentration (mg/kg)	# Samples Containing TIC
No TICs identified in the solid VOC samples for the waste stream lot.		

Did the data verify acceptable knowledge? ☒ Yes ☐ No

Data as reported in Data Summary Report – Table 4 confirm acceptable knowledge in that no toxicity characteristic organic or F-listed solvent EPA codes, are applicable.

If no, describe the basis for assigning EPA Hazardous Waste Codes.

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Data Summary Report—Table 5: Total SVOC Summary Data

WSPF # RF107.01

5A

ANALYTE <sup>a</sup>	# Samples <sup>b</sup>	Transform Applied <sup>c</sup>	Normality Test (Pass/Fail) <sup>d</sup>	Min. Sample Size <sup>d</sup>	Mean <sup>d</sup>	UCL <sub>90</sub> <sup>d</sup>	Transformed RTL <sup>e</sup>	Un-Transformed RTL <sup>e</sup> (mg/kg)	EPA Codes <sup>f</sup>
1,2-Dichlorobenzene	0				0.2			10	
1,4-Dichlorobenzene	0				0.2			150	
2,4-Dinitrophenol	0				0.1			40	
2,4-Dinitrotoluene	0				0.15			2.6	
2-Methylphenol (o-Cresol)	0				0.2			40	
3-&4-Methylphenol (m,p-Cresol)	0				0.3			40	
Hexachlorobenzene	0				0.15			2.6	
Hexachloroethane	0				0.2			60	
Nitrobenzene	0				0.2			40	
Pentachlorophenol	0				0.1			2,000	
Pyridine	0				1.408			100	

## NOTES:

- <sup>a</sup> A total of 6 samples were collected and analyzed. Analysis was performed for all analytes identified.
- <sup>b</sup> Identifies the number of samples in which the associated analyte was detected.
- <sup>c</sup> Identifies the type of data transformation used, if applicable, to achieve (or better achieve) a normal probability distribution of the data.
- <sup>d</sup> Statistics calculated based on using 1/4 the MDL values for all less-than-detectable observations with data transformation as identified (Reference 16). No entry indicates no detectable measurements available for statistics.
- <sup>e</sup> RTLs correspond to the analyte PRQL for analytes that are F-listed hazardous waste constituents or to the applicable total RTL value as calculated from the TC RTL. RTLs correspond to the analyte PRQL for analytes that are not F-listed hazardous waste constituents or characteristic hazardous waste constituents.
- <sup>f</sup> No entry indicates that the applicable UCL<sub>90</sub> value did not exceed the associated RTL.



## Data Summary Report—Table 5: Total SVOC Summary Data (continued)

WSPF # RF107.01

5B

TENTATIVELY IDENTIFIED COMPOUND (TIC) CHEMICAL ABSTRACTS SERVICE (CAS) Number	Maximum Observed Estimated Concentration (mg/kg)	# Samples Containing TIC
1,2-Benzenedicarboxylic acid, bis(2-ethylhexyl) ester (CAS No. 117-81-7) <sup>a</sup>	1.6	3
Fluoranthene (CAS No 206-44-0)	0.64	1

Did the data verify acceptable knowledge? ☒ Yes ☐ No

Data as reported in Data Summary Report – Table 5 confirm acceptable knowledge in that no toxicity characteristic organic or F-listed solvent EPA codes are applicable.

If no, describe the basis for assigning EPA Hazardous Waste Codes.

## NOTES:

- <sup>a</sup> TIC is a constituent in an F-listed waste whose presence is attributable to waste packaging materials and so was not added to the target analyte list for the waste stream. TIC was determined not to be a listed hazardous waste based on comparison of the TIC identification to acceptable knowledge (see Reference No.18).

**Data Summary Report—Table 6: Exclusion of Prohibited Items****WSPF # RF107.01**

The absence of prohibited items is documented through acceptable knowledge. Radiography or visual examination is performed on each container in this waste stream to verify the absence of the following prohibited items:

- Liquid waste (waste shall contain as little residual liquid as is reasonably achievable by pouring, pumping and/or aspirating, and internal containers shall contain less than 1 inch or 2.5 centimeters of liquid in the bottom of the container. Total residual liquid in any payload container (e.g., 55 gallon drum or standard waste box) may not exceed 1 percent volume of that container.)
- Non-radionuclide pyrophoric materials
- Waste incompatible with backfill, seal and panel closure materials, container and packaging materials, shipping container materials, or other wastes
- Explosives or compressed gases
- Waste exhibiting the characteristics of ignitability, corrosivity or reactivity
- Non-mixed hazardous waste

Newly generated waste is characterized by visual verification (VV) at the time of waste packaging using the visual examination (VE) technique unless the use of radiography in lieu of, or in combination with, visual verification is justified by any of the following criteria:

- Visual verification was conducted during packaging, but was unacceptable,
- Visual verification requires extensive handling of high gram content waste that results in high radioactive exposure for the VV personnel,
- Situations where waste packaging is conducted at numerous locations generating small quantities of transuranic waste requiring a large number of VV personnel, and/or
- Where waste was originally packaged as low-level waste, but subsequently determined to be transuranic.

Each container of waste is certified and shipped only after radiography and/or VE either:

- Did not identify any prohibited items in the waste container, or
- All prohibited items found in a waste container by radiography or VE are identified and corrected (i.e., eliminated or removed) through the site non-conformance reporting system.

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Data Summary Report—Table 7: Correlation  
of Container Identification to Batch Data Reports

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Package No.	Org. Package No.	Radioassay Data Package	Solid Sample Batch No. <sup>a</sup>	Metals Data Package <sup>a</sup>	VOC Data Package <sup>a</sup>	SVOC Data Package <sup>a</sup>	Headspace Sample Batch No.	Headspace VOC Data Package	RTR Data Package <sup>b</sup>
D66997	D66997	569IP1-DP-012803					03W0065	HGAS-DP-00442	5T-0329
D68991	D68991	569IP1-DP-012403					03W0074	HGAS-DP-00433	5T-0329
D69842	D69842	569IP1-DP-012403					03W0076	HGAS-DP-00436	6R-026
D70432	D70432	569IP1-DP-012403					03W0075	HGAS-DP-00432	5T-0332
DD8520	D67656	569IP1-DP-012403	WCS-03-07	ALD03020M	ALD03013V ALD03015N	ALD03013S	03W0076	HGAS-DP-00436	5T-0329
DD8521	D68254	569IP1-DP-012403	WCS-03-07	ALD03020M	ALD03013V ALD03015N	ALD03013S	03W0076	HGAS-DP-00436	MT0020
DD8522	D72266	569IP1-DP-012303	WCS-03-08	ALD03021M	ALD03017V ALD03020N	ALD03017S	04W0256	HGAS-DP-00972	5T-0332
DD8533	D64177	569IP1-DP-012403	WCS-03-08	ALD03021M	ALD03017V ALD03020N	ALD03017S	03W0076	HGAS-DP-00436	5T-0329
DD8535	D67011	569IP1-DP-012303	WCS-03-08	ALD03021M	ALD03017V ALD03020N	ALD03017S	03W0076	HGAS-DP-00436	MT0020
DD8536	D69318	569IP1-DP-012403	WCS-03-08	ALD03021M	ALD03017V ALD03020N	ALD03017S	03W0075	HGAS-DP-00432	5T-0332

## NOTES:

<sup>a</sup> No entry indicates container was not selected or used for solid sampling.

<sup>b</sup> All of the containers were characterized using radiography, and none were selected for visual examination to confirm radiography.

**Acceptable Knowledge Summary**

**WSPF # RF107.01**

RMRS-WPP-98-100, Acceptable Knowledge TRU/TRM Waste Stream Summaries, Section 7.24, TRM Solidified Inorganic Waste (D006, D007, D008, D009, D011) (attached).



**Rocky Flats Environmental Technology Site**

**ACCEPTABLE KNOWLEDGE INFORMATION**

**ACCEPTABLE KNOWLEDGE TRU/TRM  
WASTE STREAM SUMMARIES**

**RMRS-WIPP-98-100**

**Section 7.24**

**TRM Solidified Inorganic Waste (D006, D007, D008, D009, D011)**

**Profile No. RF107.01**

**Revision 3**

Reviewed for Classification/UCNI

By: Unclassified Not UCNI

Reference Exemption Number CEX-032-00

Date: June 16, 2004

Approval signatures in Site Document Control history file

7.24 TRM Solidified Inorganic Waste (D006, D007, D008, D009, D011)

Profile No. RF107.01

**Acceptable Knowledge Waste Stream Summary**

Waste Stream Name: TRM Solidified Inorganic Waste (D006, D007, D008, D009, D011)

Generation Buildings: Buildings 440, 664, 771, 774, 750 PAD, 776, 777 <sup>(4,5,9)</sup>

Waste Stream Volume (Retrievably Stored): 306 55-gallon drums <sup>(5,9)</sup>

Generation Dates (Retrievably Stored): May 1988-January 2001 <sup>(5,9)</sup>

Waste Stream Volume (Newly Generated): None <sup>(5,9)</sup>

Generation Dates (Newly Generated): N/A

Waste Stream Volume (Projected): None <sup>(9)</sup>

Generation Dates (Projected): N/A

TRUCON Content Code <sup>(1,13)</sup>: RF 132A/232A, RF 132D/232D, RF 132DF/232DF,  
RF 132J/232J, RF 132K/232K, RF 132P/232P, RF 132Q/232Q, RF 132QA/232QA

Process Knowledge Demonstrates Flammable VOCs in Headspace < 500 ppm: Yes (see Section 7.24.6)

7.24.1 Transuranic Waste Baseline Inventory Report Information <sup>(2)</sup>

WIPP Identification Number(s): RF-MT0800

Summary Category Group: S3000 Waste Matrix Code Group: Solidified Inorganics

Waste Matrix Code: S3150 Waste Stream Name: Solidified Sludge - Bldg 774 / TRM

Description from the WTWBIR: This waste stream is a solid cemented sludge.

NOTE: The Waste Stream Name has been changed to TRM Solidified Inorganic Waste (D006, D007, D008, D009, D011). Waste Matrix Code S3150 is incorrect, as the waste stream does not require further treatment for disposal, and has been re-designated Waste Matrix Code S3190 (see Section 7.24.2).

#### 7.24.2 Waste Stream Description

Transuranic Mixed (TRM) solidified inorganic waste assigned EPA hazardous waste numbers D006, D007, D008, D009, and D011 consists of solidified aqueous sludge (IDC 800). This material was generated from aqueous liquid waste treatment operations, and is similar in material, physical form, and hazardous constituents, and is therefore considered a single waste stream. Table 7.24-1 presents the waste matrix code and waste material parameters for TRM solidified inorganic waste.<sup>(3)</sup>

**Table 7.24-1, TRM Solidified Inorganic Waste (D006 - D009, D011)**

IDC	IDC Description	Waste Matrix Code	Waste Material Parameters	Weight %
800	Solidified Sludge/Aqueous Waste - Building 774	S3190, Unknown/Other Homogeneous Solids	Inorganic Matrix	100%

**IDC 800, Solidified Sludge/Aqueous Waste – Building 774:** This material consists of inorganic sludge resulting from the treatment of aqueous liquids in the Building 774 Aqueous Liquid Waste Treatment System. The sludge was solidified during packaging with diatomite and Portland cement.<sup>(4)</sup>

#### 7.24.3 Areas of Operation

TRM solidified inorganic wastes assigned EPA Hazardous Waste Numbers D006, D007, D008, D009, and D011 were generated by the following defense operations in Buildings 440, 664, 771, 774, 750 PAD, 776, and 777:<sup>(3,4,6,7,8,9)</sup>

- Waste Treatment
- Waste and Residue Repackaging

#### 7.24.4 Generation Processes

TRM solidified inorganic waste assigned EPA hazardous waste numbers D006, D007, D008, D009, and D011 was generated from aqueous liquid waste treatment operations in Building 774. A two-stage basic waste treatment, precipitation, and filtration process generated aqueous sludge. Acidic wastes were neutralized with sodium hydroxide in stage one. Ferric sulfate and Purifloc flocculant were added to the neutralized waste (containing metal ions) to precipitate the sludge prior to filtration. In stage two, ferric sulfate, magnesium sulfate, calcium chloride, and Purifloc flocculant were added to basic wastes during the two-stage treatment to precipitate sludge. The sludge slurry from the acidic and basic waste treatment was drawn through a diatomite filter media on a rotating drum filter to trap the solids. The filter media and sludge were continuously scraped off the drum filter and co-fed into a 55-gallon drum with additional diatomite and Portland cement added to the drum as the sludge collects, making up the solidification process.<sup>(4,6)</sup>

The aqueous liquid waste fed to the treatment process was piped from Building 771 plutonium recovery operations (steam condensate, acid condensate, scrubber waste, ion column effluent, and process waste sinks) to Building 774, as was waste generated within Building 774 (silver recovery effluent and floor washdown).<sup>(4,6)</sup>

Containers of TRM solidified inorganic waste are repackaged or overpacked to meet WIPP waste acceptance criteria in Buildings 440, 664, 771, 750 PAD, 776, and 777.<sup>(4,7,8,9)</sup>

Process flow diagrams can be found in the BWR Baseline Book and WSRIC Building Books referenced in Section 7.24.8.

Section B-3a(1)(i) of the WIPP WAP allows for reduced headspace gas sampling for homogeneous solid waste streams with no VOC-related hazardous waste codes. Specifically, a waste stream may qualify for reduced headspace gas sampling if it complies with the following three criteria:

- The waste stream or waste stream lot must consist of more than 10 containers.
- The waste stream must be a homogeneous solid waste stream that has no VOC-related hazardous waste codes assigned to it.
- The results of the solid sampling and analysis must confirm that no VOC-related hazardous waste codes should be assigned to the waste stream.

The TRM Solidified Inorganic Waste (D006, D007, D008, D009, D011) waste stream complies with each of these criteria as follows:

- The waste stream consists of 306 containers of waste.<sup>(9)</sup>
- The waste stream is a homogeneous solid that has no VOC-related hazardous waste codes assigned to it.<sup>(3,4)</sup>
- Reference 10 provides the documentation of the solid sampling and analysis results that confirmed no VOC-related hazardous waste codes need to be assigned to this waste stream.<sup>(10)</sup>

#### 7.24.5 RCRA Characterization

This waste stream is characterized as a mixed waste. The specific BWR Baseline Book Subpopulations and WSRIC Process Numbers associated with TRM solidified inorganic wastes assigned EPA hazardous waste numbers D006, D007, D008, D009, and D011 are listed in the WEMS AK Waste Stream Summary for Profile Number RF107.01.<sup>(5)</sup>

Visual examination of waste contents at the time of packaging and/or RTR is used to verify that the waste stream is not a liquid waste and does not contain explosives, non-radionuclide pyrophoric materials, compressed gases, or reactive waste. Therefore, this waste stream does not exhibit the characteristics of ignitability (D001), corrosivity (D002), or reactivity (D003).



RCRA-regulated organic compounds were not contaminants in feed liquids to the Building 774 aqueous liquid waste treatment system, or used in the generating or repackaging processes.<sup>(4)</sup>

The materials in this waste stream are toxicity characteristic for RCRA metals. Cadmium, chromium, and silver are present in liquids treated in the Building 774 aqueous liquid waste treatment system. Cadmium and silver are present as contaminants in aqueous liquids from the Building 774 Silver Recovery process, which were fed to the Building 774 aqueous liquid treatment system. Chromium is present as a contaminant in ion exchange effluent from Building 771 Anion Exchange, Cation Exchange, and Special Recovery Anion Exchange processes, which were also fed to the Building 774 aqueous liquid treatment system. Confirmatory sampling/analysis for total metals identifies chromium (D007) and silver (D011) at levels above their associated RTLs. Although the UCL<sub>90</sub> value for cadmium (D006) is not above the RTL, EPA hazardous waste number D006, assigned by AK, is conservatively retained for this waste stream. Lead (D008) was also identified at levels above the associated RTL, therefore EPA hazardous waste number D008 is added to the waste stream. Additionally, EPA Waste Code D009 (mercury) is conservatively added to the waste stream although the UCL<sub>90</sub> value calculated using the WIPP approved method from the confirmatory sampling/analysis results for mercury was below its associated RTL. Therefore, D006, D007, D008, D009, and D011 are assigned to this waste stream.<sup>(4,10)</sup>

The materials in this waste stream do not contain, are not mixed with, and/or derived from the treatment of F-listed hazardous constituents. Liquids fed to the Building 774 aqueous liquid waste treatment system were generated in Building 771 or Building 774 and were not F-listed wastes. F-listed hazardous constituents were not used in the aqueous liquid waste treatment process. Therefore, this waste stream is not F-listed waste.<sup>(4)</sup>

Beryllium parts were used in the manufacture/assembly of weapons components. Solid sampling results indicate that payload containers of this waste stream may contain beryllium in quantities greater than 1 percent by weight of the waste. Therefore, in accordance with the approved RF 132/232 TRUPACT-II Content Code and WIPP WAC requirements, shipments of containers from this waste stream will be limited to 100 Fissile Gram Equivalents (FGE) per container and 100 FGE per TRUPACT-II. Beryllium is a contaminant of the process that generated the waste and is not an unused commercial chemical product, and, therefore, is not a P015-listed waste.<sup>(1,3,4,13)</sup>

No discarded chemical products, off-specification species, chemical residues, and spill residues thereof (40 CFR 261.33) were included in this waste stream and no hazardous waste from specific sources (40 CFR 261.32) was generated at the site. Therefore no K, U, or P listings have been applied to this waste stream.<sup>(4)</sup>

Confirmatory solid samples were also analyzed for total VOC and SVOC constituents. Statistics were calculated based on using one-half the method detection limit (MDL) for less-than-detectable observations with data transformation applied where appropriate. Using this "WIPP directed" method, the calculated 90 percent upper confidence limit

(UCL<sub>90</sub>) of the mean concentrations did not exceed its associated PRQL value for any of the analytes. Consequently, no new EPA Hazardous Waste Codes are required to be added to the EPA Hazardous Waste Codes assigned by AK for this waste stream.<sup>(10)</sup>

Headspace gas sampling and analysis of containers assigned to this waste stream by AK detected 1 VOC, toluene. Statistics were calculated based on using one-half the method detection limit (MDL) for less-than-detectable observations with data transformation applied where appropriate. Using this "WIPP directed" method, the calculated 90 percent upper confidence limit (UCL<sub>90</sub>) of the mean concentrations for none of the analytes were found to exceed their associated RTL values. Therefore, the headspace data confirms the acceptable knowledge characterization that no characteristic volatile organic or F-listed solvent EPA codes are applicable.<sup>(11)</sup>

1,2-Benzenedicarboxylic acid, bis (2-ethylhexyl) ester, which is a U-listed compound, was detected as a tentatively identified compound (TIC) in the solid sampling data. An evaluation was completed that determined this compound was not used in the processes that generated this waste stream and is not present as an unused commercial chemical product. Therefore, the presence of this TIC does not render the waste stream a U-listed hazardous waste.<sup>(12)</sup>

#### 7.24.6 Transportation

The payload containers in the waste stream must also comply with the TRUPACT-II Authorized Methods for Payload Control (TRAMPAC) requirements. Flammable volatile organic compounds (VOCs) were not identified in this waste stream based on the descriptions in the *BWR Baseline Book* and *WSRIC Building Books*, and headspace gas sampling and analysis. Therefore, flammable VOCs in the payload container headspace do not exceed 500 ppm.<sup>(4)</sup>

#### 7.24.7 Radionuclides

Table 7.24-2 summarizes the radionuclides that may be present in TRM solidified inorganic waste assigned EPA hazardous waste numbers D006, D007, D008, D009, and D011.<sup>(3)</sup>

Table 7.24-2, TRM Solidified Inorganic Waste (D006 - D009, D011) Radionuclides

IDC	Description	Radionuclides	Rationale
800	Solidified Sludge/Aqueous Waste - Building 774	WG Pu, Am-241, DU, EU, Np-237, Am-243	IDC generated from treatment of aqueous liquid waste from Buildings 771 and 774.

Key: WG Pu weapons-grade plutonium  
 Am-241 americium-241  
 DU depleted uranium  
 EU enriched uranium  
 Np-237 neptunium-237  
 Am-243 americium-243

#### 7.24.8 References

1. Kaiser Hill 2004. Letter from Gerald A. O'Leary to Mike Caviness, Washington TRU Solutions, LLC. Request for New or Revised Transuranic Package Transporter (TRUPACT-II) Content (TRUCON) Codes and Update of Chemical Lists from Rocky Flats Environmental Technology Site (Site), GAO-012-04, April 2, 2004.
2. DOE 1995. Transuranic Waste Baseline Inventory Report, Revision 2. DOE/CAO-95-1121.
3. RMRS 2004. RFETS TRU Waste Acceptable Knowledge Supplemental Information. RF/RMRS-97-018, Revision 13.
4. RFETS 2004. Backlog Waste Reassessment Baseline Book, Waste Form 55, Building 774 Aqueous Sludge.
5. Waste and Environmental Management System (WEMS) database.
6. RFETS 1993. Waste Stream and Residue Identification and Characterization Building 774, Version 5.0.
7. RFETS 1991. Waste Stream and Residue Identification and Characterization Building 776, Version 3.2.
8. RFETS 2002. Waste Stream and Residue Identification and Characterization Building 776\_777, Version 7.0.
9. Wastren 2004. Interoffice Memorandum from Scott Smith to Waste Records Center. Current and Projected Waste Volumes for TRM Solidified Inorganic Waste (D006, D007, D008, D009, D011) RF107.01, SMS-008-2004, May 12, 2004.
10. Interoffice Memorandum from Thomas R. Gatliffe to Eric L. D'Amico, Statistical Solid Analysis Data Evaluation Report For Waste Stream Profile RF107.01 (TRM Solidified Inorganic Waste [D006, D007, D011]) Lot 2, TRG-079-04, March 8, 2004.
11. Interoffice Memorandum from Douglas K. Sullivan to Eric L. D'Amico, Headspace Gas Analysis Data Evaluation Report For Waste Stream Profile RF107.01 Lot 2, DKS-009-04, May 10, 2004.

12. Interoffice memorandum from Vivian S. Sendelweck to Eric D'Amico, Tentatively Identified Compounds in TRM Solidified Inorganic Waste (D006, D007, D011) Solid Sampling Lot 2, VSS-006-2004, March 10, 2004.
13. Washington TRU Solutions LLC 2004. Letter from Mike Caviness to G. A. O'Leary, Kaiser-Hill Co. LLC. Approval Letter for Revisions Made in Response to Request GAO-012-04, TP:04:05015, UFC:5822.00, May 24, 2004.